ABSTRACT OF THE DISCLOSURE

This ion source is set up to satisfy a relation

$$L < 3.37B^{-1}\sqrt{(V_A)} \times 10^{-6}$$

where the arc voltage applied between a plasma production

5   vessel 2 and a filament 8 is V_A[V], the magnetic flux density

of a magnetic field 19 within the plasma production vessel 2

is B[T], and the shortest distance from a most frequent electron

emission point 9 located almost at the tip center of the

filament 8 to a wall face of the plasma production vessel 2

10   is L[m].